Review of Current and Future Consumption Trends For Milk and Dairy Products[1]

A widely accepted fiction in the United States is that the demand for milk and dairy products is on the decline. Even the rationale for this symposium was developed "from a concern that consumption of milk was decreasing." I believe that what has happened in recent years is that the widespread discussions of cholesterol impacts and the declines in a couple of highly visible products, whole milk and butter, have nurtured this fairly pessimistic impression that a continuing erosion in demand confronts us.

In fact, I hope to slice up this demand/consumption topic in several ways in these next few minutes and conclude on three notes.

1. Per capita commercial consumption of all milk and dairy products on a milk equivalent basis in the United States has been relatively constant around the 520 pound level since the late 1960s. I view that as a positive observation.

2. Aggregate commercial demand for milk and dairy products has continued to increase directly with population and reached a record 126.8 billion pounds in 1984.

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[1]Jacobson, Robert E., Professor, Agricultural Economics, The Ohio State University, for presentation at Symposium at 80th annual meeting of the American Dairy Science Association, Urbana, Illinois, June 12, 1985.

3. The mix of factors affecting commercial demand for milk and dairy products suggests that per capita milk consumption will continue to reflect stable numbers through the remainder of this century, and total demand for milk will increase on average by almost 1 percent per year.

These observations may not be rosy viewpoints, but they are a long way from some of the doom and gloom comments that we often hear.

The ADSA Education Committee has asked me to initiate this symposium by taking note of three topics: (1) review previous consumption data by product; (2) discuss factors which have affected consumption; and (3) predict future trends in consumption. I hope to do these things in the somewhat broader context of the total market for food and for milk and dairy products.

A first observation, whether we are talking about the past, present, or future U.S. milk market, is that basically we can limit ourselves to the domestic market. Exports of dairy products are negligible (generally less than 3 percent of our production) and show little potential due to relatively high domestic prices, GATT policies that protect market shares of other exporting countries, and limited total international dairy trade. Similarly, Section 22 import quotas continue to be effective and restrictive, and mean that imported dairy products will amount to only 2 to 3 percent of our national milk market. It is true that we

continue to hear about new export opportunities, and also about the dismantling of Section 22 import quotas, but history suggests that significant change in either one is unlikely. The point is that as we consider the market for milk and dairy products, we are looking primarily at a domestic production -- domestic consumption situation.

Aggregate Commercial Demand For Milk -- U.S.

A primary measure of the effective market for any product is the aggregate commercial demand for that product. By that standard, the U.S. milk market has shown significant growth since 1970. Consider the following data:

Table 1. Domestic Commercial Milk Usage, U.S., 1970-1984[2]

Year	Total Market*
1970	110.8 Bil. Lbs.
1975	114.2
1980	119.5
1981	121.0
1982	122.5
1983	123.0
1984	126.8 Bil. Lbs.

*Annual consumption excluding donations from USDA supplies.

The 16 billion pound increase from 1970 through 1984 -- a market expansion of 15 percent in this past decade and a half, shows consistent commercial dairy market growth. If we choose to describe this market growth in terms of two factors -- per

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[2] Dairy - Outlook and Situation, ERS-USDA, DS-398, September, 1984, p. 18, and National Dairy News, May 17, 1985, p.1

capita consumption and population -- we must acknowledge population growth as the primary cause because per capita consumption of all milk and dairy products on a milk equivalent basis has been relatively constant through this period.

Per Capita Consumption of Milk and Dairy Products: Commercial Sources and All Sources

The recent 15 year performance in per capita consumption of milk and dairy products in the U.S. shows as follows (Table 2).

Table 2. Per Capita Consumption of Milk and Dairy Products, United States, 1970-1984[3]

	Per Capita Consumption	
	Commercial Sources	All Sources
1970	511 Lbs. m.e.	561 Lbs. m.e.
1975	506	540
1980	509	544
1981	519	543
1982	520	561
1983	517	578
1984	528 (estimate)	582

There are two data series reported in Table 2. The more relevant series in evaluating demand is Commercial Sources. The difference in the two series is that milk consumed on farms, USDA donations, and school milk are not included in the Commercial Sources column.

As a 15 year observation, the Commercial Sources series has to be considered one of high stability, or little change, in the

[3]Ibid, p. 18, and Dairy, Outlook and Situation Report, ERS-USDA, DS-400, March, 1985, p. 23.

506 to 530 pound range. Unfortunately, too many of us still recall that in the early 1930s, per capita consumption on a milk equivalent basis approximated 820 pounds annually,[4] and we use that as a benchmark for assessing the demand situation. In the 1930s (in fact, in the first one-third of this century), per capita butter consumption consistently was at the 18 pound level. Since the milkfat equivalent factor we currently use for butter is that it requires 20.65 pounds of milk to provide the fat for one pound of butter, our slide in per capita butter consumption from 18 pounds then to about 4 pounds now means that our per capita milk consumption series is down by 290 pounds (14 pounds butter decrease multiplied by 20.65 factor), solely because of decreased butter usage. I do not think that is a fair way to measure the changing demand for milk and dairy products. I do believe that many of us have gained a pessimistic impression of the milk market because the milk equivalent data are so widely used. But beyond the milk equivalent issue, any reference to consumption data that goes back more than 15 or 20 years is irrelevant in analyzing today's demand situation or tomorrow's demand situation. The data reported in Table 2 go back to 1970, and the clear message is one of a very stable per capita dairy consumption situation.

Food Consumption -- Product Pounds

A review of milk and dairy product consumption on a product

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[4] Dairy Statistics Through 1960, Stat. Bul. No. 303, ERS-USDA, page 381.

pounds basis, and in competition with all other foods, provides some mixed signals. Consider the data in Table 3.

Table 3. Per Capita Food and Dairy Product Consumption, Retail Weight Equivalent, U.S., 1970-1984[4]

Year	Per Capita Food Consumption	Per Capita Dairy Consumption	Dairy as Percent of Food Consumption
1970	1,397 Lbs.	336 Lbs.	24 pct.
1980	1,405	307	22
1981	1,394	304	22
1982 Prel.	1,387	302	22
1983 Prel.	1,396	305	22
1984 Fore.	1,395	303	22

The retail weight of dairy products per capita dropped from 336 pounds in 1970 to the 305 pound plus/minus range in the 1980s. As a percent of all food consumption (sometimes referred to as share of stomach space), dairy product consumption is down a couple of points from 1970, but shows a lot of stability. Just as a matter of history, dairy products accounted for 22 percent of all food consumption back in 1910.[5]

These data on share of food consumption accounted for by dairy products are important. One point is that milk and dairy products overall have maintained themselves as a primary component of our food consumption. A second point is that per capita food consumption is very constant over time. Goals for dairy market expansion must recognize this so-called "inelasticity of the stomach wall." In our generic promotion programs, for example,

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[4] National Food Review, Winter 1984, NFR-25, ERS-USDA, p. 17.

[5] Agricultural Statistics - 1967, U.S. Department of Agriculture, pp. 691, 693.

we must recognize the question -- "If people are going to consume more dairy products, what are they going to consume less of?" One observation from these data is that it may be a tough job to increase per capita dairy product consumption, but inroads from other food products are not as serious as we sometimes think them to be.

Per Capita Commercial Demand For Milk and Dairy Products

The consuming public spent 15.2 percent of its disposable income for food in 1984. Of the food dollar, 12.5 percent was spent for milk and dairy products (down from 14.0 percent in 1970). In Table 4, for as many individual dairy products for which data are available (23), with data going back to 1970, per capita commercial demand for milk and dairy products in the U.S. are reported.

Table 4. Per Capita Commercial Demand For Milk and Dairy Products, U.S., 1970-1983[6]

	1970	1976	1980	1983
Whole milk	229 Lbs.	167 Lbs.	141 Lbs.	130 Lbs.
Lowfat milk	44	59	72	78
Skim milk	14	12	12	11
Flavored milk/drinks	8.8	11	10	10
Buttermilk	5.7	4.8	4.2	4.3
Half and half	3.0	2.5	2.5	2.7
Light cream	0.4	0.4	0.2	0.3
Heavy cream	0.6	0.6	0.7	0.8
Sour cream, dips	1.1	1.7	1.8	2.1
Yogurt	0.9	2.2	2.6	3.2
Eggnog	0.3	0.4	0.4	0.5
Butter	4.4	4.3	3.9	3.8
American cheese	6.8	8.8	8.9	8.9
Other cheese	4.4	6.6	7.9	9.0
Cottage cheese	5.1	4.7	4.5	4.2
Evap/Cond/Whole milk	6.6	4.8	3.7	3.8
Evap/Cond. Skim milk	5.0	3.6	3.3	3.2
Nonfat dry milk	4.7	3.4	2.8	2.7
Dry buttermilk	0.2	0.2	0.2	0.2
Dry whey	0.9	2.4	2.7	3.1
Ice cream	17.9	18.1	17.5	18.0
Ice milk	7.7	7.2	7.1	6.9
Sherbet	1.6	1.5	1.3	1.3
Commercial demand (m.e.)	511 Lbs.	515 Lbs.	509 Lbs.	517 Lbs.

[6] Dairy - Outlook and Situation, ERS-USDA, DS 381, 397-398, July, 1980 and June and September, 1984.

The following observations are pertinent relative to the per capita demand data:

1. Whole milk (3.25 percent butterfat) continues to decline at a significant rate and now accounts for only about 59 percent of the fluid milk market.

2. The continuing increase in lowfat milk sales (mostly 2 percent butterfat) indicates that lowfat milk has been a major substitute for whole milk.

3. Cream sales in total are reflecting a positive uptrend in recent years. Sterilization and packaging techniques are a big factor.

4. The hard cheeses in total, which utilize almost 30 percent of the U.S. milk supply, reflect continued growth, especially in the Italian-Swiss-Cream categories.

5. The evaporated/condensed products are down in demand and have little prospect for recovery.

6. Frozen dairy products continue to hold at a constant level. Ice milk, which was a remarkable growth product in the 1950s and 1960s, has retreated somewhat in demand.

7. Demand for nonfat dry milk is hurting. Approximately two-thirds of U.S. nonfat dry milk production is purchased by the government in the dairy price support program. The April 1, 1985 decision to implement a 50 cent decrease in the support price by dropping the nonfat dry milk purchase price by 6.25 cents per pound (to 84.75 cents), and making no change in the butter purchase price, as a step in the direction of making nonfat dry milk a competitive product in the marketplace. We could see the same thing happen again on July 1, 1985 when the support price will probably be cut another 50 cents to $11.60 per cwt.

Apart from the data in Table 4, there are some other observations on dairy demand that are worth noting.

1. The substitution problem continues to evidence itself.

   a. In 1983, per capita margarine was 11.0 pounds as compared to commercial butter demand of 3.8 pounds. Butter and margarine have been basically at a standoff in recent years, with margarine commanding about three-fourths of the spread market.

   b. Mellorine, the imitation frozen dessert, has virtually disappeared from the marketplace. Per capita consumption was 0.2 gallons in 1983, down from 1.2 gallons in 1970.

c. With respect to imitation cheese, we'll get the complete story from Truman Graf later in this symposium. His earlier studies have reflected large inroads in the mozzarella cheese market, with some substitution in American type cheese. The one point I would add is that Harold Steinke, a widely respected cheese marketer with Borden, Inc., projects that imitation cheese will not capture more than 10 percent of the cheese market in this next twenty-five years.[7]

Fluid Milk Trends

With fluid products utilizing almost 40 percent of the U.S. milk supply, a couple of additional points need to be made.

First, in 1970, 73 percent of the lowfat milk in the U.S. was fortified, i.e., had SNF added. In 1983, only 15 percent of the lowfat milk marketed had solids added. Similarly, 75 percent of the skim milk marketed in 1970 was fortified; in 1983, only 23 percent of the skim milk was fortified. So we see a situation where consumers have not only switched from whole milk to lowfat milk, but also a situation where lowfat milk carries significantly less SNF than it once did. Part of the momentum for changing FDA standards of identity for fluid milk products comes from these trends. My opinion is that consumers did not want lower solids milk. Instead, processors reacted to high

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[7]Steinke, Harold, "Future Impacts of Imitation Cheese," Proceedings of the 39th Midwest Milk Marketing Conference, The Ohio State University, March, 1984, p. 97.

prices for SNF (nonfat dry milk) and effectively promoted the lower solids beverages. I hope without much optimism that lower nonfat dry milk prices will bring renewed competition in fluid milk markets with added solids being a point of product differentiation.

On another score, it is useful to assess the position of milk in the total beverage market. In this decision, we at least have to recognize the question as to whether fluid milk has substitution relationships with other beverages. I am inclined to think there is little substitution because I never pour Pepsi on my corn flakes; neither do I ever drink milk after a golf game. But it is true that fluid milk consumption has declined even as consumption of other beverages has increased. Consider the data in Table 5.

Table 5. Proportions of Total Beverage Consumption Per Capita Identified With Different Beverages, U.S., 1962 and 1982[8]

	1962	1982
Per Capita Beverage Consumption	114 Gals.	133 Gals.
Proportion by Major Beverages:		
Milk	29.0 Pct.	20.3 Pct.
Coffee	33.4	18.3
Soft drinks	14.1	29.7
Beer	13.2	18.3
Fruit juice/tea	8.2	10.3
Wine/liquor	2.0	3.1
	100.0 Pct.	100.0 Pct.

[8]Bunch, Karen and Karland, Julie, "How America Quenches Its Thirst," National Food Review, NFR-27, 1984, ERS-USDA, pp. 14-17.

Total beverage consumption in the six categories identified has increased by 17 percent in the past twenty years (to 133 gallons per person per year). Coffee and milk are the two losers; soft drinks and beer are the big winners. There may be some substitution effects relative to milk, but I suspect they are modest at best. The trends in fluid milk consumption are explained by other forces.

Factors Affecting Milk and Dairy Product Consumption

I will summarize briefly those factors that have been identified as affecting the demand for milk products. Let me start with a quote from a recent USDA report: "The largest foreseeable changes in the per capita demand for dairy products will probably be caused by the aging of the population. Bureau of the Census projections indicate that dramatic changes are likely to occur in the age distribution of the population during the remainder of this century. The proportion of the population under 40 is expected to drop from about 64 percent in 1980 to 56 percent in 2000. This growth in the over-40 populatic n and the decline in the proportion of teens and preteens may significantly reduce per capita fresh milk expenditures by the year 2000. These changes may also decrease total dairy expenditures per person. But, they may have a positive effect on expenditures for cream cottage cheese, and table fat, especially butter."[9]

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[9]Blaylock, James R. and Smallwood, David M., "Household Characteristics, Frequency of Use, and the Demand For Dairy Products," Dairy - Outlook and Situation, DS-397, June, 1984, ERS-USDA, pp. 24-28.

This age conclusion is based on the 1977-78 Nationwide Food Consumption Survey as those results interface with the age distribution projection. Table 6 shows age projections to the year 2000.

Table 6. Projections of U.S. Population's Age Distribution[10]

Age Group	Proportion of Total Population		
	1980	1990	2000
Under 5	7.2 pct.	7.7 pct.	6.6 pct.
5 - 14	15.5	14.2	14.3
15 - 19	9.3	6.8	7.1
20 - 39	32.0	32.8	28.0
40 - 64	24.9	24.9	31.0
Over 64	11.3	12.7	13.1

I mention age distribution first because it appears to be the primary change factor as we look ahead. The traditional economic factors in demand analysis, price and income, are important and emerge as significant in study after study. The demand for milk and dairy products is inelastic with respect to both price and income, with price recording minus coefficients and income showing positive coefficients. In studies that generate short run and long run estimates, the long run coefficients for all dairy products generally show that the price-quality relationship becomes more elastic. I have a five page summary of selected dairy product demand studies available for anyone who wants it. Cross-elasticity estimates with substitute products are not as available.

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[10] Ibid., p. 28.

Some other factors affecting demand for milk products are noted as follows:

1. Advertising-promotion: The 15 cent per cwt. promotion assessment referendum is scheduled for August 1-20, 1985, so we are cognizant of the generic promotion question. Analyses of the impact of generic promotion generally conclude that fluid sales can be increased by 3-4 percent and cheese sales by 10-15 percent by effective advertising-promotion programs.[11] However, the programs must be sustained in order for the increase to hold.

2. Region - For all dairy products, consumers in the Northeast expend more for dairy products ($2.26 per week) than do consumers in other regions. Consumers in the West spent 5 percent less; consumers in the North Central spent 13 percent less; and consumers in the South spent 15 percent less.[12]

3. Season - There are some obvious seasonal demand factors for dairy products such as the summer season and ice cream demand. Across all dairy products, spring is the "quietest" demand period, with summer, fall, and winter demand running about 6 percent over spring.

4. Race - The Nationwide Food Consumption Survey revealed that weekly dairy expenditures for white persons averaged $2.11. For

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[11] Farr, Charles et al., Increasing Returns To Dairy Farmers By Generic Promotion of Milk and Dairy Products: The Issue of Which Products To Promote, ESO 1162, Agr. Econ. - Ohio State U., April 1985, p. 19.

[12] Op. cit., Blaylock and Smallwood, p. 26.

blacks, weekly dairy expenditures were 25 percent under that amount; and for non-white non-black racial groups, expenditures were 6.4 percent under the whites.[13] The fairly modest changes in our race distribution as we look to the future indicate that if these expenditures hold, the race factor will have little impact on consumption.

The economic, demographic, and attitudinal factors affecting milk and dairy product consumption are a continuing study. These brief comments have only overviewed a small part of the information available.

Future Trends In Milk Consumption

Rather than predicting future trends in individual milk and dairy product categories, I come back to aggregate commercial demand for milk as the focus for looking ahead. Aggregate commercial demand, again, is a function of population and per capita commercial demand. By simplifying the process this way, one is simply attempting to capture all of the economic, demographic, and attitudinal factors in a single measure called per capita commercial demand and then relating that to population change.

The population assumption is straightforward. Since the

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[13] Ibid., p. 27.

mid-1970s, population growth in the United States has averaged almost 1 percent per year.[14] Resident population stood at 227.2 million in 1980 and had climbed to 237.3 million on January 1, 1985. Assuming that resident population grows at the rate of 0.9 percent annually through this next decade, we will attain a population of 260 million people early in 1995.

The per capita consumption projection is the more difficult one. As noted previously, there has been a high degree of stability in the per capita consumption (milk equivalent) series since 1970, both the Commercial Sources series and the All Sources series. I am persuaded that in this next decade there is no obvious basis for presuming any significant upward or downward changes in the per capita milk equivalent series.[15] The demographics (age distribution in particular) are on the negative side. But favorable consumer prices, rising income levels, and effective dairy promotion programs should cancel out the demographic changes. Substitution is a concern, but the milk industry has effectively responded to substitution with technology (cream sterilization) and promotion (Real cheese).

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[14] Statistical Abstract of the United States - 1984, 104th Edition, U.S. Dept. of Commerce, p. 6.

[15] Jacobson, Robert E., "Economics and Possible Effects of New Products and Technology On Where the Industry Will Be Going In the Future," Proceedings of the National Invitational Workshop On Genetic Improvement of Dairy Cattle, Cornell University, April, 1984, p. 4.

Given these considerations, a projection of 525 pounds milk equivalent in per capita commercial demand to 1995 seems reasonable. That would generate an aggregate commercial demand of 136.5 billion pounds of milk in 1995 -- almost 10 billion pounds more than the 126.8 billion pound preliminary estimate for 1984. Anyone choosing to be more optimistic or less optimistic about dairy demand can move off of the 525 pound projection.

Since the 525 pound projection reflects per capita commercial demand, and since per capita consumption from all sources has averaged about 30 pounds higher than commercial demand, it is useful to project the market using a 555 pound per capita consumption factor. In 1995, a 260 million population at 555 pounds milk equivalent per capita would mean a total demand of 144.3 billion pounds of milk.

The market for milk in the next ten years is going to be larger than it is today. Even the pessimists who would drop to 500 pounds per capita commercial demand in 1995 would see a total demand for 130 billion pounds of milk, a little larger than our present market.

The assumptions used in making these projections are, at the same time, rough and delicate. All of the factors affecting the demand for milk and dairy products need to be continually monitored as we try to compete in a dynamic marketplace.